obvious that adequate endowment is essential. To provide this, and properly equip the observatory, several thousand pounds are needed; but the Committee have no assurance that anything at all approaching the necessary amount has yet been subscribed or even promised. As they have now been in existence for between three and four years with this negative result, they are of opinion that the Committee should now be dissolved." In consequence of this resolution the Committee have not drawn the £20 voted at Birmingham, and they do not now request their reappointment.

Report of the Committee on Tidal Observations in Canada.—In the absence of Prof. Johnson, Mr. Robert E. Baynes presented this report. He said that no grant had yet been obtained from the Dominion Government, for though the Hudson Bay Expedition was ended, the Canadian Government had undertaken to pay half the expenses of the re-survey of the Gulf of St. Lawrence. This survey would probably take two years, but when it was concluded there was the greatest possible expectation that a special grant might be given to the Committee. In the meantime, Lieut. Gordon, commanding one of the Dominion cruisers, had been ordered to make certain preliminary observations.

Report of the Committee on Magnetic Observations.—The Committee had met at various intervals during the year. The subject which chiefly occupied them at present was the diurnal variation of terrestrial magnetism and the reduction of the observations. The great difficulty of the Committee was the want of proper observations in the southern hemisphere. The observations which had been made went to show that the two hemispheres were pretty well symmetrical, and at present the Committee had to take for granted that it was so. They hoped in another year to be able to give a more complete report, and some definite results.

Report of the Committee on Standards of Light.—The Committee have compared the standards hitherto proposed, but have not done much. Prof. Adams has, however, presented a report of some experiments, and the Committee think that if funds are provided they will be able to settle the question of standards.

Report of the Committee on Differential Gravity Meters.—Since last report the Committee have received from Mr. Boys an account of experiments in which he is engaged. They await the result of those experiments before proceeding with the construction of an instrument.

Report of the Committee on the Translation of Foreign Scientific Memoirs.—In reply to a communication from the Committee to the Royal Society, Prof. Reinold has informed them that the Royal Society is not at present able to undertake the publication of foreign memoirs in a systematic manner, but anything of special interest would be attended to.

NOTES.

WE learn that the Government of Jamaica offers a premium of £100 for the production of the best practical elementary text-book of tropical agriculture specially applicable to Jamaica, and embodying the first principles of agriculture. It is stated that the object of the manual is to create in the mind of the young an early and intelligent interest in the soil and its products, and particular attention is to be paid to simplicity, brevity, and freedom, as far as possible, from technical terms. It is stated that the propagation and cultivation of tropical economic plants should have due prominence. Manuscripts are to be forwarded to the Government of Jamaica on or before August 1, 1888.

THE Iron and Steel Institute held their autumn meeting at Manchester last week. It was an entire success both as regards the papers and discussions and the excursions to industrial works and places of interest in the neighbourhood. We shall give a report of the proceedings in our next week's issue.

ONE point which seems to be determined by the news which has just reached Zanzibar concerning Emin Pasha is that Albert Nyanza and Muta Nzige are two distinct lakes, a point which has hitherto been doubtful. It is stated that in the recent campaign between Mwanga, King of Uganda, and his neighbours the whole country between these two lakes has been laid waste. Doubtless we shall soon have full details as to this, as well as to the results of the recent explorations, from Emin Pasha himself.

MR. RICHARD QUAIN, F.R.S., Surgeon Extraordinary to the Queen, died on Thursday at his residence, 32 Cavendish Square, at the age of eighty-seven. He began his career in 1828, and speedily rose to high distinction. He wrote many books on medical subjects, such as "Anatomy of the Arteries of the Human Body," and was Honorary Fellow of the Medical and Surgical Society of Edinburgh, Emeritus Professor of Clinical Surgery in University College, Consulting Surgeon at University College Hospital, and President of the Royal College of Surgeons.

THE Annual Congress of the Sanitary Institute of Great Britain was opened on Tuesday at Bolton. Lord Basing delivered the Presidential Address, in which he reviewed what has been done for the protection of public health since the importance of the question was brought home to the minds of legislators. An exhibition of sanitary appliances and apparatus was opened at the same time in the Drill Hall at Bolton.

THE University College of Bristol has recently been enabled by the generosity of local firms to make a notable advance in the matter of engineering education. At a meeting held in the early part of the present year the desirability of instituting engineering scholarships was considered. The practical result of this meeting was that most of the firms of the neighbourhood agreed to institute bursaries, or scholarships, at their works. The holders of these are to be nominated by the College authorities. Some will be awarded on the results of the annual examinations, while others will be reserved for deserving students who may be unable to pay the usual premiums required on entrance into works. The educational scheme adopted at Bristol does not include any attempt to impart practical workshop instruction within the College walls, but the students will spend six months (April to October) in each year acquiring practical experience in the works and drawing offices of the engineers of the west of England. This system is found to answer so well that Messrs. Stothert and Pitt, of Bath, and the Bristol Wagon Works Company propose to make it obligatory on all their pupils to attend the College courses in the winter months for the first three years of their pupilage. Several firms have also signified their willingness to take College students for short periods, so that civil engineering and electrical engineering pupils may spend one or two terms of six months in works, while at the same time mechanical engineers may have experience in two or three different establishments during their College career. In return for these concessions the Council of the College has decided to permit deserving apprentices or artisans, nominated by the local engineers, to attend the College courses at reduced rates. It is expected that about nine first-class scholarships, and a larger number of second-class ones, will be available during the coming session.

MESSRS. CROSBY LOCKWOOD AND CO. will publish during the forthcoming season the following scientific and technical works:—"Flour Manufacture: a Treatise on Milling Science and Practice," by Frederick Kick, translated by H. H. P. Powles, illustrated; "A Dictionary of Terms used in the Practice of Mechanical Engineering"; "Practical Surveying," by George Wm. Usill; "The Mechanical Engineer's Office Book," by Nelson Foley (second edition); "British Mining: a Treatise on the History, Discovery, Practical Development, and Future Prospects of the Metalliferous Mines in the United Kingdom," by Robert Hunt, F.R.S. (second edition); "The Watchmaker's Hand-book," from the French of Claudius Saunier, translated and enlarged by Julien Tripplin; "Our Granite Industries," by Geo. F. Harris; "Marble and Marble-Workers," by Arthur Lee; "Tables, Memoranda, and Calculated Results for Mechanics, Engineers, Architects, Builders, Surveyors, &c.," by Francis Smith (fourth edition). Also the following new volumes in Lockwood's Series of Handy-books for Handicrafts: "The Mechanic's Workshop Handy-book," "The Model Engineer's Handy-book," "The Cabinet-Worker's Handy-book," "The Clock-Jobber's Handy-book," all by Paul N. Hasluck. Also the following new editions in Weale's Rudimentary Scientific Series: "A Treatise on Mathematical Instruments," by J. F. Heather; "The Mineral Surveyor's and Valuer's Complete Guide," by Wm. Lintern (second edition).

THE English edition of Naegeli and Schwendener's treatise on "The Microscope," by Mr. Frank Crisp and Mr. J. Mayall, will be published shortly by Messrs. Swan Sonnenschein and Co. The book was first sent to press in the autumn of 1878, was printed by April 1883, and was then entirely burnt in a fire at the printers'. It has since been revised and again printed, and will at length be in the hands of the public.

THE Syndics of the Cambridge University Press will publish early in October two works on "Elementary Chemistry." One, intended as a companion to lecture-work, is by Mr. Pattison Muir and Dr. Charles Slater; the other, intended to be used along with the book already mentioned, is a course of laboratory work by Mr. Pattison Muir and Mr. Carnegie. Both books deal with the subject of elementary chemistry in a manner somewhat different from that usually adopted in text-books.

THE International Shorthand Congress will meet in the Geological Museum, Jermyn Street, on September 26 and five following days. The inaugural address will be delivered by the Earl of Rosebery, and various papers on subjects connected with shorthand will be read. Men of science, like every other class of the community, are under a debt of gratitude to those who exercise the art of shorthand writing, and will wish the organizers of the Congress every success. We are glad to observe that one of the papers to be read is on the subject of shorthand in education, for the art is unquestionably an invaluable adjunct to any system of education, and is so useful, especially to those engaged in scientific pursuits, that it should be one of the subjects which every youth destined for a scientific career should acquire.

WE have received from the Essex Institute of Salem one of its occasional papers, describing a collection of Japanese pottery made by Prof. Morse, Director of the Peabody Academy of Science, Salem. The author is Mr. Sylvester Baxter, and his description is the first authorized account of the collection. An exhaustive work on the subject by Prof. Morse himself is preparing for publication.

Science states that in order to expedite the publication of short articles upon astronomical and meteorological subjects which may be prepared at Harvard College Observatory, it has been decided to print them as successive numbers of a series, which will constitute the eighteenth volume of the "Annals of the Observatory" when a sufficient amount of material has thus been collected. Each number will be published and distributed soon after it has been prepared.

DURING this month will appear, under the editorship of Dr. G. H. Rohé, a quarterly journal, the *Climatologist*, devoted to the consideration of questions in the domain of medical and sanitary climatology. As there is at present, says *Science*, no other journal in the world exclusively occupying this special field, the editor and publishers believe that there is room for such a publication. Each number will contain forty-eight quarto pages of reading-matter, the subscription price will be fifty cents per year, and the place of publication, S.E. Cor. Baltimore and South Streets, Baltimore, Md.

A SERIES of new salts, remarkable alike for their crystalline beauty and explosive proclivities, has recently been prepared by M. Klobb, of Nancy (*Ann. de Chimie et de Physique*, September 1887, p. 5). These salts, which contain at the same time groups of such opposite properties as ammonia and permanganic acid, are generally obtained by the addition of cold solutions of potassium permanganate to ammoniacal solutions of certain metallic salts; for example, with silver nitrate the compound $AgMnO_4 . 2NH_3$ is obtained as a crystalline dark-violet powder, decomposing on warming, with detonation. The salts of copper, cadmium, nickel, and zinc give analogous compounds, but it is around the salts of cobalt that the interest mainly concentrates. The ordinary simple salts of cobalt only yield compounds which are immediately oxidized, but the ammonio-cobalt salts, and especially the more stable ones known as luteo-cobalt salts, form the most interesting of the series. Luteo-cobalt permanganate, $(Co_2 . 12NH_3)6MnO_4$, is prepared by mixing concentrated solutions of luteo-cobalt chloride, $Co_2 . 12NH_3 . Cl_6$, and potassium permanganate in the proportion of one to twelve molecules, at a temperature not exceeding 60°; on cooling, the salt separates out in little black octahedra or pyramid-capped prisms belonging to the quadratic system, and exhibiting a fine lustre. If the carefully powdered crystals be warmed in a tube, they suddenly decompose with incandescence, and if the same warming operation be performed upon the crystals themselves, the instantaneous incandescence is accompanied by a loud detonation, the tube being shattered into fragments. If a crystal be struck with a hammer, a violent detonation is again the result, even powdering of the crystals in a mortar being accompanied by dangerous decrepitations. Compounds in which hydrochloric and hydrobromic acids partially replace the manganic acid have also been prepared, together with a most lovely salt of the composition $(Co_2 . 12NH_3)4MNO_4 . Cl_2—2KCl$, which forms dark-violet hexagonal plates, sometimes bearing low six-sided pyramids, and frequently grouped together in the form of six-rayed stars resembling the forms of snow-flakes. All these salts are of a more or less explosive character, but the luteo-cobalt permanganate itself is by far the most violent.

DURING last summer the Hydrographical Survey Office of Norway effected a series of soundings along the north-west coast of that country. The results have just been published. The Islands of Værö and Röst, at the extremity of the Lofodden group, were surveyed; and here the end of the great fishing-bank projecting from these islands appears to have been discovered. About 5 miles west of these islands a depth of 50 fathoms was found, the bottom being sand. Inside this the bottom gradually becomes more shallow, with occasional "skaller" or mounds. Outside the 50-fathom line the bottom gradually slopes, until about 50 miles west of Röst the depth is 100 fathoms. Here this depth runs in a line nearly north to south for a distance of about 60 miles, viz. from the southernmost islet by Röst to the latitude of Moskenæsö, one of the Lofodden Islands. South of the former islands the bank trends eastwards for about 6 miles, and, north of the latter, westwards for about 35 to 40 miles, when it again trends east and north-east. Inside the line indicated the bottom is everywhere fine sand mixed with pebbles and remains of shells. Some 75 miles west of Röst the depth was 150 fathoms, but on approaching this depth the bottom becomes clayey. Here the edge of the bank was struck, the depth oceanwards rapidly falling from 150 to 300 fathoms. About 85 miles west of Skomvær a depth of 438 fathoms was struck, the bottom being clay, and a sounding from the series of the Norwegian North Atlantic Expedition taken 5 miles further out shows a depth of 593 fathoms with similar bottom. The lines for the 150, 200, 250, 300, and 350 fathom depths seem to run nearly parallel; but as they approach closer to the 100-fathom line of depth northwards, the bank apparently falls more abruptly into the ocean in this direction. This is borne out by former soundings along the coast of the Lofodden and Vesteraalen groups of islands. Thus outside the Islands of Langö, Andö, and Senjen, the edge of the bank will probably be found only 20 miles from the shore, whilst north of the latter island we know it sheers rapidly straight northwards from the shore. A provisional map, scale 1 : 200,000, of the districts sounded has been prepared. The discovery of the limits of this bank will, it is believed, be of great importance to the Norwegian fisheries, as it is the spawning-ground of the herring and cod which descend every year in immense shoals from the North Atlantic.

The Report of the Trustees of the Australian Museum of Sydney for the past year shows progress in most directions. The number of visitors has increased, the collections are increasing rapidly, especially in the natural history departments, and the building is increasing in size, and is still too small. Catalogues of Australian zoology are in course of preparation, and amongst the new publications which will shortly be issued is a catalogue of shells, one of eggs, one of sponges and Medusæ, and one of Australian birds. The Trustees also append a Report from the Committee of Management of the Technological, Industrial, and Sanitary Museum, which, like so many other institutions of the same character, suffers sorely from want of adequate space. "The Curator reports that the crowded state of the Museum is inconvenient to visitors, and that, apart from locomotion having become difficult, it is now impossible for a teacher or a parent to gather young people around a show-case for purposes of instruction." We are accustomed in this crowded country to limited space and difficult locomotion, but what have they to do with such things in boundless Australia? The specimens are increasing with great rapidity owing to many valuable donations, which is all the more reason why the Museum should be properly housed.

The last number (No. 28, vol. xii.) of the *Excursions et Reconnaissances* of Saigon contains the conclusion of Père Azemar's elaborate paper on the Stieng tribe, which was commenced in No. 27. It describes the forays, dress, ornaments, manners, religion, houses, intoxicating beverage, food, hunting, and industry of the Stiengs. The writer's knowledge of the tribe may be judged from the circumstance that he has resided amongst them as a missionary, as one of themselves, for five years. The greater part of the number is occupied with the second portion of his dictionary of the Stieng language. The letters H to V occupy nearly a hundred pages in double columns.

We have received copies of two papers read by Mr. H. C. Russell before the Royal Society of New South Wales—one on floods in Lake George, the other on the history of floods in the Darling River—both being accompanied by excellent maps. Mr. Russell's object is to produce all the historical facts accessible to him relating to these floods, with the dates. He believes that there is a cycle of nineteen years in the occurrence of the floods.

The Proceedings of the Liverpool Naturalists' Field Club for the year 1886-87 is largely occupied by a third "Appendix to the Flora of Liverpool," by Mr. Robert Brown. The second Appendix was published as far back as 1875, and during these twelve years much additional information has been gathered respecting the distribution of plants within the district of the Field Club. In Mr. Brown's present list special reference is made to about 168 species, while some species new to the neighbourhood and new localities are mentioned.

The additions to the Zoological Society's Gardens during the past week include a White-crowned Mangabey (*Cercocebus æthiops*) from West Africa, presented by Mr. C. Washington Eves; two Vervet Monkeys (*Cercopithecus lalandii*) from South Africa, presented by Capt. Archibald Douglas, R.N.; a Bonnet Monkey (*Macacus sinicus*) from India, presented by Mrs. La Primandage; a Brown Capuchin (*Cebus fatuellus*) from Guiana, presented by Mr. W. R. Sheppard; a Sharp-nosed Crocodile (*Crocodilus acutus*) from Central America, presented by Mr. E. H. Blomefield; a Mississippi Alligator (*Alligator mississippiensis*) from Florida, presented by Mr. William J. Craig; four Common Chameleons (*Chamæleon vulgaris*) from North Africa, presented by Mr. H. Thornton; six Aurora Snakes (*Lamprophis aurora*) from South Africa, presented by Mr. Walter K. Sibley; a Raven (*Corvus corax*), British, deposited; a —— Ichneumon (*Urva cancrivora*) from Nepal, two Tesselated Snakes (*Tropidonotus tesselatus*), four Dark-green Snakes (*Zamenis atrovirens*), seven Common Snakes (*Tropidonotus natrix*, var.), South European, purchased.

OUR ASTRONOMICAL COLUMN.

New Variable.—Prof. Lewis Boss, in *Gould's Astronomical Journal*, No. 160, draws attention to the star DM. + 3° No. 766. Its magnitude in the DM. is given as 9·2m., and Argelander, who observed it twice with the Bonn meridian circle, gave it the same magnitude in the "Bonner Beobachtungen." Prof. Boss, however, was unable to find it with the Albany meridian circle in 1880 and 1881, but has since picked it up with the 13-inch equatorial of the Observatory as an 11·5m. star. It would therefore appear to be either a "temporary" star or a variable of long period.

The Dearborn Observatory.—The Report of the Director of the Dearborn Observatory recently issued is for the two years ending May 10, 1887. Prof. Hough's principal work is that with the great 18½-inch equatorial, and includes observations of difficult double stars and of Jupiter. During the period to which the Report refers 130 new double stars have been discovered and measured. Of these, 45 have a distance less than 0″·5, 11 have a distance between 0″·5 and 1″·0, and the remainder belong to the class of stars having very minute companions. The companion to Sirius has been measured in 1886 and also in 1887. The planet Jupiter has been systematically observed with reference to the physical phenomena on his surface, special attention having been paid, as in former years, to the great red spot. With regard to this remarkable object, Prof. Hough reports that in outline, shape, and size it has remained without material change since the year 1879. During 1885 the middle of the spot was very much paler in colour than the margins, causing it to appear as an elliptical ring. This ring-form has continued up to the present time, although during the last three years the spot has at times been so faint as to be scarcely visible. Four sketches of the planet made in 1886 are given in the Report. The appendices to the Report contain: a catalogue of 209 new double stars, and a description of a printing chronograph, by Prof. Hough; nebulæ found at the Dearborn Observatory 1866–68, by Prof. Safford; orbit of the Clark companion of Sirius, and motion of the lunar apsides, by Mr. Colbert. The last-named paper is of a "paradoxical" character, and we much regret that the Directors of the Chicago Astronomical Society should have recommended its publication.

The Spectra of Hydrogen, Oxygen, and Water Vapour.—Prof. Grünwald, of Prague, has recently published (*Astr. Nachr.* 2797), a brief account of a theory respecting the relationship of the spectra of gases and their compounds, which, if it should prove well founded, will be of the highest importance in the light it promises to throw on the structure of many of those substances we now call "elements." The fundamental idea is as follows:—Let $[a]$ be the volume occupied by a primary chemical element, a, in the unit of volume of a gaseous substance, A. Let A be chemically combined with a second gaseous body, B, to form a third, C. The element a now takes the form a' and